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(71) Anmelder (für alle Bestimmungsstaaten mit Ausnahme von US): AIRBUS DEUTSCHLAND GMBH [DE/DE]; Kreetslag 10, 21129 Hamburg (DE).

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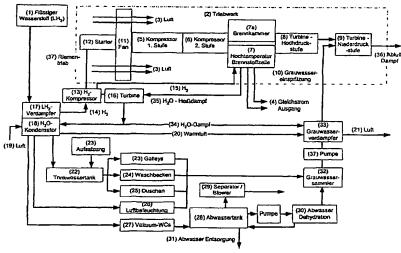
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- (81) Bestimmungsstaaten (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR,

[Fortsetzung auf der nächsten Seite]

- (54) Title: DEVICE FOR PRODUCING WATER ON BOARD OF AN AIRPLANE
- (54) Bezeichnung: ANORDNUNG ZUR ERZEUGUNG VON WASSER AN BORD EINES LUFTFAHRZEUGES



1 Liquid hydrogen

2 Engine

3/19/21 Air

- 4 DC output
- 5 Compressor 1st stage
- 6 Compresso
- 2<sup>nd</sup> stage
- 7 High-temperature fuel cell
- 7a) Combustion chamber
- 8 Turbine high-pressure stage
- 9 Turbine low-pressure stage
- 10 Injection of grey water
- 13 R<sub>2</sub> compressor
- 17 LR<sub>2</sub> evaporator 18 HaD condenser

- 20 Hot air
- 22 Drinking water tank
- 23a Salting
- Washbasin 24 25 Shovers
- 26 Air humidification
- 27 Vacuum WCs
- Waste water tank 28
- Waste water dehydration 30 31 Waste water disposal
- 32 Grey water collector
- 33 Grev water evaporator 34 H<sub>2</sub>O steam
- 35 H<sub>2</sub>O hot steam
- 36 Exhaust air/steam 37 Pump
- 37a Belt drive

(57) Abstract: The invention relates to a device for producing water on board of an aeroplane by means of one or several fuel cells. The inventive water producing device is embodied in the form of one or several high temperature fuel cells (7) and entirely or partially integrated into a jet power unit of the airplane in such a way that the combustion chambers (7a) of said jet power unit of the airplane are entirely or partially substituted by said high temperature fuel cells. The aim of said invention is to develop a combination of fuel cells and a gas turbine which operates exclusively with atmospheric hydrogen and oxygen and is embodied in the form of a jet power unit and/or an auxiliary jet power unit (on-board auxiliary power unit: APU) used for producing compressed air for a cabin and a power supply. For this purpose, said high temperature fuel cells are fed with pure hydrogen on an anode side and with air on a cathode side. The combustion chambers (7a) are fed with an air-hydrogen mixture, enabling at least the hydrogen supply to be adjusted or completely shut off.

[Fortsetzung auf der nächsten Seite]

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CU, CZ, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Bestimmungsstaaten (regional): ARIPO Patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), eurasisches Patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), europäisches Patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL,

PT, RO, SE, SI, SK, TR), OAPI Patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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Zur Erklärung der Zweibuchstaben-Codes und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.

(57) Zusammenfassung: Anordnung zur Erzeugung von Wasser an Bord eines Luftfahrzeuges unter Verwendung von einer oder mehreren Brennstoffzellen, wobei eine teilweise oder vollständige Integration einer Wassererzeugungseinheit in Form von einer oder mehreren Hochtemperatur-Brennstoffzellen (7) in einem Flugzeugtriebwerk derart vorgesehen ist, dass Brennkammern (7a) des Flugzeugtriebwerkes ganz oder teilweise durch die Hochtemperatur-Brennstoffzellen ersetzt werden. Um eine Brennstoffzellen-Gasturbinen-Kombination für den ausschließlichen Betrieb mit Wasserstoff und Luftsauerstoff, als Triebwerk und/oder als Hilfstriebwerk (APU - Auxiliary Power Unit) zur Druckluftversorgung der Kabine und zur Stromerzeugung vorzusehen, werden den Hochtemperatur-Brennstoffzellen anodenseitig reiner Wasserstoff und kathodenseitig Luft zugeführt. Weiterhin wird den Brennkammern (7a) ein Gemisch aus Wasserstoff und Luft zugeführt, wobei mindestens die Wasserstoffzufuhr regulierbar oder vollständig abschaltbar ausgeführt ist.

## INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATT IPC 7 B64D11/02 F0

B64D41/00

H01M8/04

According to International Patent Classification (IPC) or to both national classification and IPC

#### B. FIELDS SEARCHED

 $\begin{array}{ccc} \text{MinImum documentation searched} & \text{(classification system followed by classification symbols)} \\ IPC 7 & B64D & F01K & F02C & H01M \end{array}$ 

Documentation searched other than minimum documentation to the extent that such documents are included. In the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

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Further documents are listed in the continuation of box C.	Patent family members are listed in annex.
Special categories of cited documents:  "A" document defining the general state of the art which is not considered to be of particular relevance  "E" earlier document but published on or after the international filing date  "L" document article may throw doubts on priority claim(s) or which a categorie establish the publication date of another citation or after special reason (as specified)  "O" document referring to an oral disclosure, use, exhibition or other means	<ul> <li>*T* later document published after the international filing date or priorily date and not in conflict with the application but cited to understand the principle or theory underlying the invention</li> <li>*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</li> <li>*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled</li> </ul>
"P" document published prior to the international filing date but later than the priority date claimed  Date of the actual completion of the international search	in the art.  *&* document member of the same patent family
28 April 2004	Date of mailing of the international search report 07/05/2004
Name and mailing address of the ISA  European Patent Office, P.B. 5818 Patentlaan 2  NL - 2280 HV Rijswijk  Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  Fax: (+31-70) 340-3016	Authorized officer  Salentiny, G
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A. KLASSIFIZIERUNG DES ANMELDUNG IPK 7 B64D11/02 F0

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B64D41/00

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#### B. RECHERCHIERTE GEBIETE

Recherchierter Mindestprüfstoff (Klassifikationssystem und Klassifikationssymbole )

IPK 7 B64D F01K F02C HO1M

Recherchierte aber nicht zum Mindestprüfstoff gehörende Veröffentlichungen, soweit diese unter die recherchierten Gebiete fallen

Während der siternationalen Recherche konsultierte elektronische Datenbank (Name der Datenbank und evtl. verwendete Suchbegriffe)

EPO-Internal, WPI Data, PAJ

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